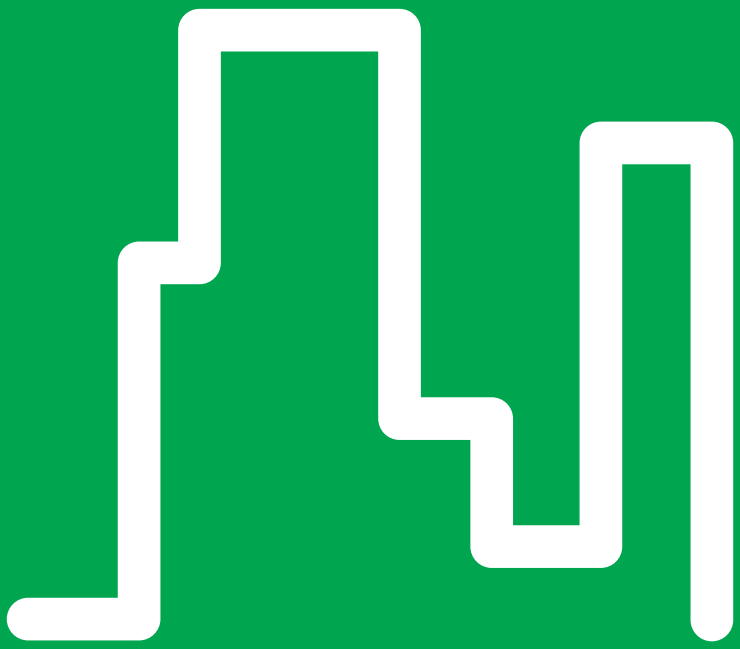
SeeTool - Solutions for KNX

Office building segment



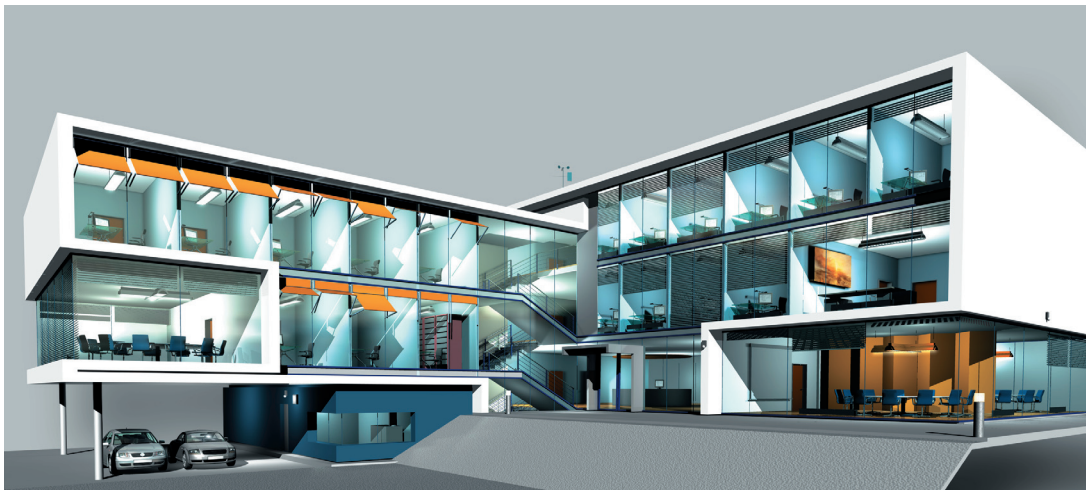
Application 8.2.1.0.0.4

Movement dependent automatic light control with light regulation and manual control, temperature control (electrical heating with 16A Solid State Relay and cooling with KNX EMO valve drive) and blind/ shutter control, single room

Schneider Electric

Lighting, temperature and blind/shutter control functions

Lighting and temperature control functions: The lights are automatically switched ON or OFF dependant on people's movement and existing brightness. When the lights are on, the light controller in the presence detector maintains the decided lux set point by dimming the lamp actuator dependant on the available daylight. In addition three predefined light levels and a permanent OFF can be activated manually by push-button. Temperature controller tries to keep room temperature at it's setpoint by controlling Solid State Relays for heating and a KNX EMO valve drive for cooling. The movement detection will automatically set the temperature control either into comfort or standby mode. A connected window contact will set the temperature control into frost/heat protection mode when the window is open.
Blind/Shutter control functions: A blind or roller shutter motor with end position can be connected to each channel of the blind actuator. The position of the blind's or shutter's height can be adjusted manually by push-buttons. At slat-blinds an adjustment of the slat's angle is possible as well.



Application areas

The application is defined to be used in office rooms and/or conference rooms where the level of light will be kept constant taking into account the amount of natural light. The solution offers sophisticated control of the lighting, heating and cooling with an automatic movement detector and additional manual control plus an open window sensing function to set temperature at comfort and standby mode.

Energy savings

Combining the presence and daylight function with temperature control to the room application, we are able to utilize the daylight and temperature factors to optimize and save energy during the active period of use throughout the year. Presence dependant lighting control plus daylight harvesting can achieve a 60% electricity saving compared to installations without automatic function. At temperature side presence dependant control can lead to savings of up to 20% yearly in compare to rooms without automatic control functions.

Future proof

The application is prepared and defined for integration into a Building Management System if required, through the open technology communication network.

Flexibility

For optimized costs the device's functional interaction is predefined. Functionality can be modified or changed at any time in the lifecycle and allows a maximum of flexibility and adaptation when walls are removed and rooms combined.

Reliability

Design, planning and installation documents are pre-defined which makes the entire building process faster and more reliable. User documents and descriptions are prepared to assist in user training. The application works as an individual, stand alone room control unit or combined with the entire network.

Lighting

up to 60% energy saving

Temperature

up to 20% energy saving

EN 15232
A class solution

tested & validated

Technical specifications

Functions

Lighting control: The lights are automatically switched ON when a person enters the room and the brightness value is below the selected brightness threshold. If no movement is detected within a delay time of 25 minutes, the light will be dimmed down to minimum. If no movement is detected for another 5 minutes the light will be switched off.

When the lights are on, the light controller in the presence detector maintains the decided lux set point by sending dimming telegrams to the lamp actuator.

If the daylight will increase, the regulation dims down the artificial light. If it decreases, the regulation will dim up the artificial light.

The lux set point after download and power failure is adjustable by ETS software. The default lux setpoint at the reference surface (e.g. desk) is 500 lux ±20% hysteresis.

The user can also select the lux setpoint by the push-button unit. Button 1 will give high brightness (500 lux), button 2 will give medium brightness (300 lux) and button 3 low brightness (100 lux). With button 4 permanent-OFF can be activated. The light will then be off until one of the other buttons is pressed. When permanent OFF is activated the status LED next to the button is blinking.

Temperature control: Temperature controller tries to keep room temperature at it's setpoint by controlling SSR's (Solid State Relay) pulse width from 0 to 100%. SSR is totally silent so it could be installed more freely. If comparing to mechanical relay its lifetime is much longer because there is not any moving parts inside. SSR switches ON and OFF in zero-crossing voltage so it don't generate any electrical noise to the power line. Cooling is controlled by a KNX EMO valve drive.

Movement detection will automatically set the temperature control into comfort-mode. To save energy this will not happen until a person has been in the room for more than 3 minutes. In this way the temperature control is not affected if someone is present in the room just for a short period of time. If no movement is detected within a delay time of 25 minutes the temperature control is set into standby-mode.

If a window contact (breaking contact) is connected to the EMO valve drive the temperature control will be set into frost/heat protection mode when the window is open.

Comfort-mode: default room temperature setpoint	heating 21 °C cooling 24 °C
Standby-mode: default room temperature setpoint	heating 19 °C cooling 26 °C
Frost/Heat protection:	heating 7 °C cooling 35 °C

The setpoint can be adjusted by the user +/- 3°C from given setpoint. This is done by pushing „invisible" buttons on both sides of the display frame.

Blind/shutter control: A blind or roller shutter motor with end position can be connected to each channel of the blind actuator. The position of the blind's or shutter's height can be adjusted manually by push-buttons.

With a long pressure on button 5 the blind or roller shutter moves upwards. With a long pressure on button 6 the blind or roller shutter moves downwards. With a short pressure the movement of the blind or shutter stops.

In the case of a blind or hanging with slats the angle of the slats can also be moved stepwise with several short pressures. With button 6 the slats turn to the position „100% closed" or to the mechanically determined working position. With button 5 the slats move to the opposite direction. The possible angles of the slats depend from the mechanical construction of the blind with slats.

Scene control: A scene for a beamer presentation can be recalled with button 7. Thereby the blinds or shutters will be lowered to 80% closed and the light will be set to a low lux-level (50 lux). By use of button 8 the blinds or shutters will be moved completely upwards again and the standard lighting level (500 lux) will be activated.

Technical specifications

Components

functions

Application consists of one presence detector, one temperature controller with buttons, one DIN-rail 0-10V control unit (mounted in the cabinet or close to the room), one blind actuator, one solid state relay connected to an analog actuator (heating) and one EMO valve drive (cooling).

MTN647091	KNX Control Unit 0-10V REG-K/1-gang with manual mode
MTN630919	KNX ARGUS Presence with light control and IR receiver
MTN639118	KNX EMO valve drive with 2 binary inputs
MTN649802	KNX Blind actuator REG-K/2x/10 with manual mode
MTN682291	KNX Analog actuator REG-K/4-gang
MCBC2425CL	Crydom Solid State Relay + HS201DR heatsink + TP01 thermal pad

Design ranges

(Frames not included. Other designs and colours available.)

EXXACT

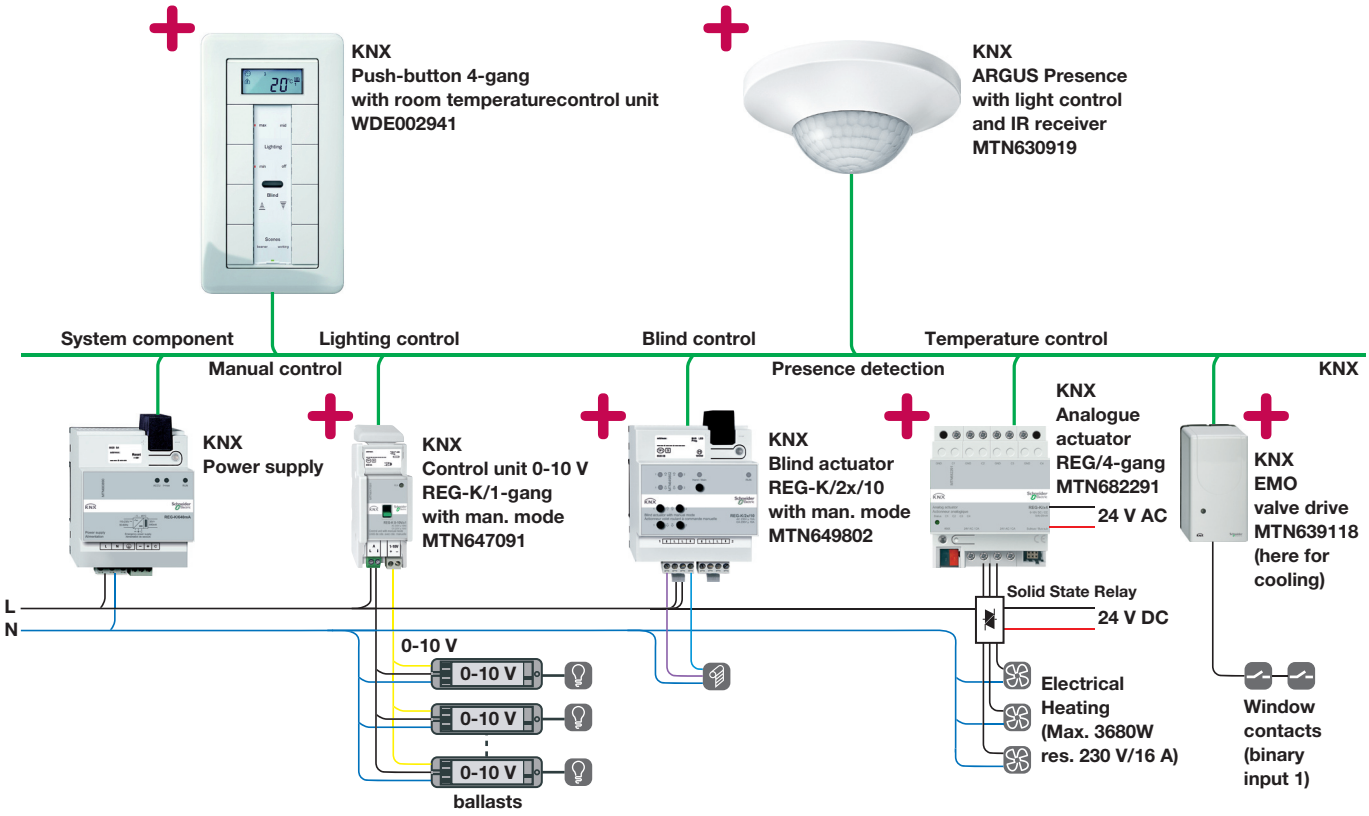
WDE002941	KNX PB 4-gang with room temperature control unit

Installation

The presence detector is intended for ceiling mounting in a size 60 mounting box. It can also be mounted to ceilings using the surface mounting housing for ARGUS Presence (art.no. MTN550619).

Technical specifications

Wiring diagram



things work together

Technical specifications

Note

Number of controlled electronic interfaces highly depends on used ones, check with manufacturer recommendations.

An electronic interface takes high inrush current. It is recommended that Type C MCB's (Miniature Circuit Breaker's) are used. Using Type B leads to decreased number of units.

If window contact is not used, green and yellow wire has to be tied together (shortcircuit).

settings

Configuration

The ETS tool is used to set the parameters for the devices in the application and to define the functional relationship between the devices by group addresses.

The following parameters and group address relations must be set and assigned. The parameters should be set first and in the described order. The parameters which can be changed to fine tune the application are described further on.

KNX Argus presence with light control				
12	Switch object 1	Block 2	1 bit	–> 2/1/3
60	Switch output	Closed-loop	1 bit	–> 1/1/1
61	Dimming output	Closed-loop	4 bit	–> 1/1/2
62	Setpoint 1	Closed-loop	1 byte	–> 1/1/3
64	Fb. operat. mode	Closed-loop	1 bit	–> 1/1/9
70	Value input	Closed-loop	1 byte	<– 1/1/8
71	Lux value setting	Closed-loop	2 byte	<– 1/1/7
107	Result. act. value	Send	2 byte	–> 1/1/6 (optional)
109	Status feedback	Safety pause	1 bit	<– 1/1/4
110	Status feedback	Brightness	1 byte	<– 1/1/5

General	
Actual value correction:	enable
Actual value (0-2000 Lux) installation site	
Lamp switched off:	_____
Max. brightness of lamp:	_____
Actual value (0-2000 Lux) reference surface	
Lamp switched off:	_____
Max. brightness of lamp:	_____
[Optional, to check regulation after download]	
Send actual value cyclically	
reference surface:	enable
Time base, send lux value:	1 s
Time factor, send lux value:	60

Block configuration	
Move/presence block 1:	disable
Move/presence block 2:	enable
Light control:	enable

Block 2 general –> Movement sensors	
Sector-orientated settings:	enable
Dead time, beginning of movement:	enable
Time base:	1 min
Time factor:	3

Block 2 general –> Brightness	
Movement detection is:	brightness independ.

Block 2 general –> Time	
Time base for staircase timer:	1 min
Time factor for staircase timer:	25

KNX Argus presence with light control	
General light control	
Automatic:	at object value 0
Memory behaviour:	parameterised setpoint value
Extended controller parameters:	enable

General light control –> Control response in automatic mode –> Times	
Time base for staircase timer:	1 min
Time factor for staircase timer:	25

General light control –> Control response in automatic mode –> Brightness	
Nominal value (10-2000 Lux) reference surface:	500
Hysteresis (10%-50%):	20

General light control –> Switching off in automatic mode	
Time base, dimming down time:	1 min
Time factor, dimming down time:	5

Technical specifications

Configuration

KNX Push-button 4-gang with RTC				
0	Object A	PB 1	2 byte	–> 1/1/7
3	Object A	PB 2	2 byte	–> 1/1/7
6	Object A	PB 3	2 byte	–> 1/1/7
9	Value object A	PB 4	1 byte	–> 1/1/8
11	Status feedb. object	PB 4	1 bit	<– 1/1/9
12	Stop/step object	PB 5	1 bit	–> 3/1/2
13	Movement object	PB 5	1 bit	–> 3/1/1
15	Stop/step object	PB 6	1 bit	–> 3/1/2
16	Movement object	PB 6	1 bit	–> 3/1/1
18	Object A	PB 7	1 byte	–> 10/1/1
21	Object A	PB 8	1 byte	–> 10/1/1
26	Extension object	Scene module	1 byte	<– 10/1/1
27	Actuator group 1	Send value	1 byte	–> 3/1/3
28	Actuator group 2	Send value	1 byte	–> 3/1/4
33	Actuator group 7	Send value	2 byte	–> 1/1/7
45	Frost/heat protection input	Control	1bit	<– 2/1/4
47	Comfort input	Control	1 bit	–> 2/1/3
62	Correcting variable heating (basic level)	Control	1 byte	–> 2/1/1
65	Correcting variable cooling (basic level)	Control	1 byte	–> 2/1/2

Push-button 1	
Select push-button function:	Edges with 2 byte values
Push-button 1 – edges values	
Value 1 = basis * factor [= 500]	
Basis (possible values in brackets):	0,32 (0 to 655,04)
Factor (0-2047):	1562
Push-button 2	
Select push-button function:	Edges with 2 byte values
Push-button 2 – edges values	
Value 1 = basis * factor [= 300]	
Basis (possible values in brackets):	0,16 (0 to 327,52)
Factor (0-2047):	1875
Push-button 3	
Select push-button function:	Edges with 2 byte values
Push-button 3 – edges values	
Value 1 = basis * factor [= 100]	
Basis (possible values in brackets):	0,08 (0 to 163,76)
Factor (0-2047):	1250

KNX Push-button 4-gang with RTC	
Push-button 4	
Select push-button function:	Switching
Object A:	1 byte in steps 0-100%
Value:	0%
Trigger status LED:	Flashes when status feedback object equals 1
Push-button 5	
Select push-button function:	Blind
Direction of movement, blind:	Up
Push-button 6	
Select push-button function:	Blind
Direction of movement, blind:	Down
Push-button 7	
Select push-button function:	Scene
Scene address (0-63):	0
Push-button 8	
Select push-button function:	Scene
Scene address (0-63):	1
Scene module	
Apply scene module:	Yes
Save scenes:	No
Scene module –> Scene actuator groups	
Actuator group 1:	Value object (8 bit in steps)
Actuator group 2:	Value object (8 bit in steps)
Actuator group 7:	Value object (16 bit floating point value)
Scene module –> Scene 1 – values	
Value 1 sending:	80%
Value 2 sending:	100%
Value 7 sending:	Telegram
Value 7 = basis * factor	
Basis (possible values in brackets):	0,04 (0 to 81,88)
Factor (0-2047):	1250
Scene module –> Scene 2 – values	
Value 1 sending:	0%
Value 2 sending:	0%
Value 7 sending:	Telegram
Value 7 = basis * factor	
Basis (possible values in brackets):	0,32 (0 to 655,04)
Factor (0-2047):	1562
Control general	
Use control:	Yes
Controller type:	Heating and cooling
Duration of comfort extension:	None
Setpoint adjustment maintained after change in oper. mode:	Yes
Control general –> Actual temperature (resultant)	
Correct internal actual temperature factor [-128...127] * 0,1 K:	0
[NOTE: See description “fine tuning”]	

settings

Technical specifications

Configuration

	KNX Control unit 0-10V REG-K/1-gang			
1/1/1 –>	0	Switch object	Channel 1	1 bit
1/1/2 –>	1	Dimming object	Channel 1	4 bit
1/1/3 –>	2	Value object	Channel 1	1 byte
1/1/4 <–	8	Status feedb. switch	Channel 1	1 bit
1/1/5 <–	9	Status feedb. value NOTE: The read flag (R) must be set	Channel 1	1 byte

1: General
Status switch: active status resp. object
Status value object: active status resp. object

1: Dimming time reduction
Set 0: dimming time reduction
for value telegram at: 6%

	KNX Blind actuator REG-K/2x/10			
3/1/1 –>	0	Movement obj. in manual mode	Channel 1	1 bit
3/1/2 –>	1	Stop/Step obj. in manual mode	Channel 1	1 bit
3/1/3 –>	2	Height position in manual mode	Channel 1	1 byte
3/1/4 –>	3	Slat position in manual mode	Channel 1	1 byte

Channel config.
Channel 1 operation mode: blind or roller shutter
[See description „fine tuning“]

1: Blind [only in case of blind]
How does the existing blind move?:
downwards closed / upwards horizontal
downwards tilted / upwards horizontal
downwards closed / upwards closed
downwards tilted / upwards closed
[See description „fine tuning“]
Slat position after movement: last slat position

1: Drive [only in case of blind]
Time base for running time of height adjustment: 100 ms
Factor for running time of height adjustm. (10-64000), 1 s = 1000 ms: _____
[See description „fine tuning“]
Time base for step interval of slat : 10 ms
Factor for step interval of slat: _____
[See description „fine tuning“]
Time base for running time of slats: 10 ms
Factor for running time of slat: _____
[See description „fine tuning“]
Pause on reverse on change in direction (1-255), factor * 100 ms, manufacturer‘s data: _____
[See description „fine tuning“]

1: Drive [only in case of roller shutter]
Time base for running time of height adjustment: 100 ms
Factor for running time of height adjustm. (10-64000), 1 s = 1000 ms: _____
[See description „fine tuning“]
Pause on reverse on change in direction (1-255), factor * 100 ms, manufacturer‘s data: _____
[See description „fine tuning“]

KNX Push-button 4-gang with RTC

Control general –> Control heating
Select heating system: Adjustment via control parameter
Proportional range for heating in 0,1 K [10-255]: 40
Reset time for heating [1-255 min]: 20

Control general –> Control cooling
Select cooling system: Adjustment via control parameter
Proportional range for cooling in 0,1 K [10-255]: 40
Reset time for cooling [1-255 min]: 20

	KNX Analog actuator REG-K/4-gang			
2/1/1 –>	0	Input value, output 1	Analog output	1 byte

General parameters
Signal output 1: 0...10 V

Output 1 1/2
Input format: 8 bit

	KNX EMO valve drive with 2 binary inputs			
2/1/2 –>	0	Control value	Input	1 byte
2/1/4 <–	7	Binary input 1	Switch	1 bit

Input 1
Function: switch/ toggle
Command on rising edge: off
Command on falling edge: on

settings

Technical specifications

Group addresses

settings

Address	Name (proposal)	Function
1/1/1	Room 001 Light On/Off	Light on/off by the light controller
1/1/2	Room 001 Light Dimming	Light dimming up/down by the light controller
1/1/3	Room 001 Light Value	Light absolute value by the light controller
1/1/4	Room 001 Light Status switch	Feedback from actuator, On/Off
1/1/5	Room 001 Light Status value	Feedback from actuator, 0-100%
1/1/6	Room 001 Light Resulting actual value	Measured lux value by light controller (corrected value)
1/1/7	Room 001 Light Lux value setting	Different lux values from push-button
1/1/8	Room 001 Light Permanent OFF (0%)	Permanent OFF, movement detector disabled
1/1/9	Room 001 Light Feedb. operation mode	Indication permanent off (0) and automatic regulation (1)
2/1/1	Room 001 Heating control value	Heating 0-100%, sent by the room temperature controller to the analog actuator
2/1/2	Room 001 Cooling control value	Cooling 0-100%, sent by the room temperature controller to the EMO valve drive
2/1/3	Room 001 Comfort/Standby mode	Change between comfort (1) and standby (0) mode
2/1/4	Room 001 Window contact	Window open (1) -> frost/heat protection
3/1/1	Room 001 Blind/Shutter Up/down	Blinds/Shutter move downwards or upwards
3/1/2	Room 001 Blinds/Shutter Stop OR Room 001 Blinds/Shutter Stop/Step	Blinds/Shutters Stop OR Blinds Stop and Change angel of Slats stepwise
3/1/3	Room 001 Blinds/Shutter Height position	Blinds/Shutters move to a Height position (0 to 100%)
3/1/4	Room 001 Blinds Slat position	Slats turn to a position (0 to 100%)
10/1/1	Room 001 Scene Call	Scene Call with values (0 = scene 1, 1 = scene 2)

Technical specifications

Actual value correction

settings

The measured brightness value (actual value) can be corrected. A distinction is drawn here between the installation location of the presence detector and the reference area (a desk surface, for example). The brightness value of the reference area is determined with the aid of actual value correction and taking the brightness value measured by the presence detector at the installation location and an internal adjustment curve into account. In the case of light regulation it is not the brightness value at the installation location which is important but the brightness value at the reference area (desk).

For actual value correction you will need a luxmeter (example: Roline TES-1335 or equivalent).

Four measurements are required for actual value correction:
- With the artificial lighting switched OFF, brightness is measured at the presence detector installation location.
- With the artificial lighting switched OFF, brightness is measured at the reference area (desk, for example).
- With the artificial lighting switched ON (maximum brightness), brightness is measured at the presence detector installation location.
- With the artificial lighting switched ON (maximum brightness), brightness is measured at the reference area (desk, for example).

The measurements can be done in daylight but not in clear sunshine, best condition is cloudy weather.

To switch ON to maximum brightness a value telegram 100% can be sent from ETS to the value object of the control unit, for example. Note: the presence detector should not be in operation at this time.

The four lux values measured must be entered as parameters in ETS.

Parameter page	Parameter	Value
General	Actual value installation site, Lamp switched OFF	0…2000 lux
General	Actual value installation site, Max brightness of lamp (100%)	0…2000 lux
General	Actual value reference surface, Lamp switched OFF	0…2000 lux
General	Actual value reference surface, Max brightness of lamp (100%)	0…2000 lux

Technical specifications

Fine tuning

fine tuning

Some parameters can be changed to fine tune the solution to the building and specific requirements. Parameter which may need to be adjusted are listed below, our recommendation in brackets.

KNX ARGUS presence detector with light control and IR receiver:
The staircase timer (delay time) will be retriggered by every detected movement when the light is on. The light will be dimmed down to minimum if no movement has been detected within the specified time.

If no movement is detected the light will stay on minimum level for a time period specified by the parameter „dimming down time“. After this time the light will be switched off.

Parameter page	Parameter	Value
General light control –> Control response in automatic mode –> Times	Time base for staircase timer	1s/1 min/1h (1 min)
General light control –> Control response in automatic mode –> Times	Time factor for staircase timer	1-255 (25)
General light control –> Switching off in automatic mode	Time base, dimming down time	1 s/1 min/1 h (1 min)
General light control –> Switching off in automatic mode	Time factor, dimming down time	1-255 (5)

Delay time = Time base x Time factor
Dimming down time = Time base x Time factor

Lux level setpoint in reference area

Parameter page	Parameter	Value
General light control –>l Control response in auto. mode –> Brightness	Nominal value reference surface	10-2000 lux (500 lux)
General light control –>l Control response in auto. mode –> Brightness	Hysteresis	10%-50% (20%)

The actual brightness value (corrected measured value) can be sent cyclically to the bus via communication object 107. This can be used for test purpose together with ETS. If it is used for other purposes, the value should not be sent too often for bus load reasons. If there is no receiver to display the value in the project, the function should be disabled after the test phase.

Parameter page	Parameter	Value
General	Send actual value cyclically, reference surface	enable/disable (disable)
General	Time base, send lux value	1s/1 min/1 h (1 min)
General	Time factor, send lux value	1-255 (30)

Cycle time = Time base x Time factor

Technical specifications

Fine tuning

fine tuning

The delay time for changing between standby-comfort is dependent on presence activity in a room. To save energy the switch-over from standby to comfort is done when movement is detected after a specified dead time. Then a staircase timer is started which will be retriggered by every detected movement. If no movement is detected the staircase timer will run out and standby mode is activated again.

Parameter page	Parameter	Value
Block 2 general –> Movement sensors	Dead time, Time base	1s/1 min (1 min)
Block 2 general –> Movement sensors	Dead time, Time factor	1-255 (3)
Block 2 general –> Times	Time base for staircase timer	1s/1 min/1h (1 min)
Block 2 general –> Times	Time factor for staircase timer	1-255 (25)

KNX Push-button 4-gang with room temperature control unit:
Push-buttons:
The end user can select brightness level (lux value) with push-button 1, 2 and 3. These values can be changed with the parameters of the push-buttons.

Parameter page	Parameter	Value
Push-button 1 – edges values	Value 1 = basis * factor (500 lux) Basis	0,01-327,68 (0,32)
Push-button 1 – edges values	Factor	0-2047 (1562)
Push-button 2 – edges values	Value 1 = basis * factor (300 lux) Basis	0,01-327,68 (0,16)
Push-button 2 – edges values	Factor	0-2047 (1875)
Push-button 3 – edges values	Value 1 = basis * factor (100 lux) Basis	0,01-327,68 (0,08)
Push-button 3 – edges values	Factor	0-2047 (1250)

With push-button 7 the end user recalls scene 1 „beamer presentation“. With push-button 8 scene 2 „working“ can be recalled.

The values of these scenes can be changed with the parameters of the scene function.
- Value 1 changes the height's position of the blind/shutter – 8 bit in steps.
- Value 2 changes the position of the slats (only for blind with slats) – 8 bit in steps.
- Value 7 sets the lux value – 16 bit floating point.

Parameter page	Parameter	Value
Scene 1 – values	Value 1 sending (height position of the blind/shutter)	No telegram, 10, 20, 25, 50, 60, 70, 75, 80, 90, 100% (80%)
Scene 1 – values	Value 2 sending (slat position – only for blind with slat)	No telegram, 10, 20, 25, 50, 60, 70, 75, 80, 90, 100% (100%)
Scene 1 – values	Value 7 = basis * factor (50 lux) Basis	0,01-327,68 (0,04)
Scene 1 – values	Value 7 = basis * factor (50 lux) Factor	0-2047 (1250)

Technical specifications

Fine tuning

Parameter page	Parameter	Value
Scene 2 – values	Value 1 sending (height position of the blind/shutter)	No telegram, 10, 20, 25, 50, 60, 70, 75, 80, 90,100% (0%)
Scene 2 – values	Value 2 sending (slat position – only for blind with slat)	No telegram, 10, 20, 25, 50, 60, 70, 75, 80, 90,100% (0%)
Scene 2 – values	Value 7 = basis * factor (500 lux) Basis	0,01-327,68 (0,32)
Scene 2 – values	Value 7 = basis * factor (500 lux) Factor	0-2047 (1562)

fine tuning

Room temperature controller:
Note: Temperature controller parameter pages uses the unit Kelvin's (K) for relative temperatures and Celsius (°C) degrees for absolute temperatures 1K = 1°C

Default setpoints for heating and cooling (depends on presence in a room)

Parameter page	Parameter	Value
Control general –> Setpoints	Heating, setpoint for comfort	5-40°C (21°C)
Control general –> Setpoints	Heating, setpoint for standby	5-40°C (19°C)
Control general -> Setpoints	Cooling, setpoint for comfort	5-40°C (24°C)
Control general -> Setpoints	Cooling, setpoint for standby	5-40°C (26°C)

The user is allowed to adjust the default setpoint +/- within specified limits

Parameter page	Parameter	Value
Control general	Max. upper setpoint adjustment	0-10 K (3 K)
Control general	Max. lower setpoint adjustment	0-10 K (3 K)

Technical specifications

Fine tuning

fine tuning

Value correction of measured temperature:
The temperature in the room is measured by the internal temperature sensor in the room temperature controller. The actual temperature is shown in the display. If the value is not representative for the room it is possible to adjust it by parameter. Actual temperature = measured temperature + adjustment value.

Parameter page	Parameter	Value
Control general –> Actual temperature (resultant)	Correct internal actual temperature factor (-128...127) * 0,1 K	0

Parameters for tuning heating control (Xp and Ti)

Parameter page	Parameter	Value
Control general –> Control heating	Proportional range for heating in 0.1K	10-255 (40)
Control general –> Control heating	Reset time for heating in min	1-255 min (20)

Parameters for tuning cooling control (Xp and Ti)

Parameter page	Parameter	Value
Control general –> Control cooling	Proportional range for cooling in 0.1K	10-255 (40)
Control general –> Control cooling	Reset time for cooling in min	1-255 min (20)

KNX Blind actuator REG/K:
At the beginning of the parameter setting you should define which kind of motor driven hangings are used. In the configuration of each channel „blind“ or „roller shutter“ can be selected.

Parameter page	Parameter	Value
Channel config.	Channel 1 operation mode	Blind / Roller shutter

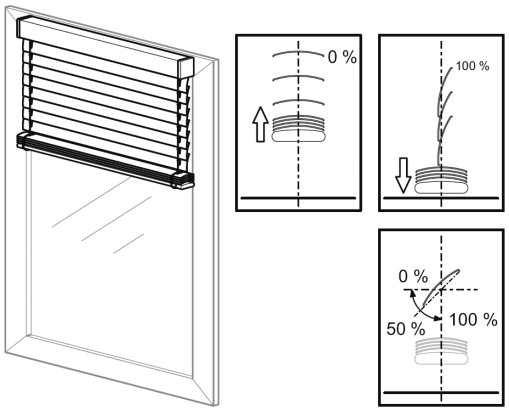
In the case of the blind configuration additional parameters for the fine tuning of the behavior of the slats are available. In the case of roller shutter these parameters are not necessary and can not be selected.

Technical specifications

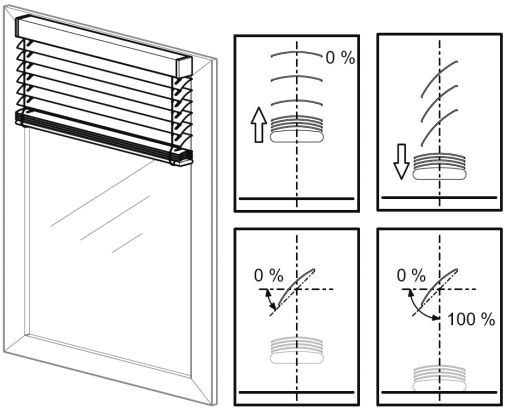
Defining blind type (only for blind with slats)

The application differentiates between four types of blind. You can determine the blind type from the position of the slats during movement. Types 2 or 4 (slats are downwards titled) should be selected when the slats have a mechanically determined working position. The working position restricts the possible opening angle of the slats, as long as the blind has not reached its lower end position.

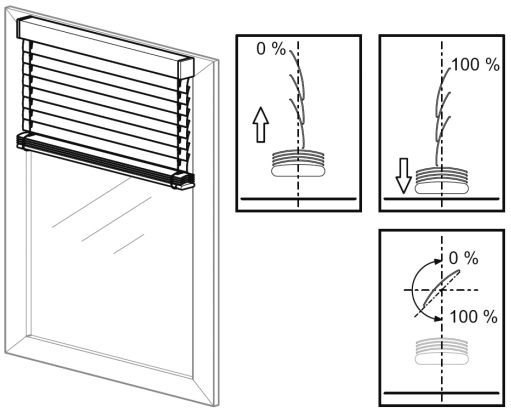
fine tuning



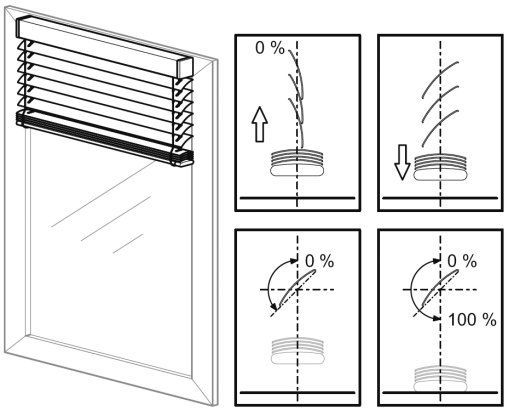
Blind type (1) without working position
downwards closed / upwards horizontal



Blind type (2) with working position
downwards tilted / upwards horizontal



Blind type (3) without working position
downwards closed / upwards closed



Blind type (4) with working position
downwards tilted / upwards closed

Parameter page	Parameter	Value
1:Blind	How does the existing blind move?	(1) downwards closed / upwards horizontal (2) downwards tilted / upwards horizontal (3) downwards closed / upwards closed (4) downwards tilted / upwards closed

Caution! Some blinds have special drive characteristics which are not congruent with one of the four types of blinds. In this case an exact positioning of the slats might be impossible.

Technical specifications

Slat position after movement (only for blind with slats)

Parameter page	Parameter	Value
1:Blind	Slat position after movement	no reaction operating position (last slat position)

fine tuning

The slat opening that you specify here is inter alia applied after a manual movement command ended by stop telegram. This is the standard way of control via long and short pressure with a push button. Please note: a mechanically determined working position restricts the possible opening angle of the slats, as long as the blind has not reached its lower end position (Blind types 2 and 4: slats are downwards tilted).

Recommendation: the slat running time should be set.

When you select „slat position after movement“: **„last slat position“** or **„operating position“** it is necessary to know the slat running time.

When you want to define the **number of steps for opening or closing the slats** you also need the running time.

Height running times

The blind actuator allows a precise positioning of the height with value objects. This positioning depends from the calculation of the running time of the used blinds and shutters. As various types of blinds and shutters are available it is not possible to recommend any default-value.

You should measure the height running time from end to end position and set the following values:

Parameter page	Parameter	Value
1:Drive	Time basis for height running time	10, (100) ms
1:Drive	Factor for running time	10 - 64000 _____ 1 second = 1000 ms

The drive needs this period of time to move out of one end position (blind/roller shutter is fully open or closed) into the opposite end position. When the set time expires the relay of channel 1 is automatically switched off (even if the drive with the values set here has not fully reached its end position).

If you want to optimize the positioning behavior additional drive parameters can be set.

Technical specifications

Slat running time (only for blind with slats)

fine tuning

The slat running time is the period of time it takes the slat to complete a full movement from 0% to 100% or vice versa. The regulating range through witch the opening angle passes depends on the type of blind in use.

Type (1): slats 100% = downwards closed and lower end position closed
slats 0% = upwards horizontal

Type (2): slats 100% = downwards tilted (= mech. working pos.) - lower end position = closed
slats 0% = upwards horizontal

Type (3): slats 100% = downwards closed and lower end position closed
slats 0% = upwards closed

Type (4): slats 100% = downwards tilted (= mech. working pos.) - lower end position = closed
slats 0% = upwards closed

The opening angle after a movement of type (1) and (3) is directly influenced by the running time of the slats.

The opening angle after a movement of type (1) and (3) is also influenced by the mechanically determined working position. The slats can only move up to the working position (e.g. 75%), as long as the lower end position of the height is not reached. When this end positions is reached, the slats can move up to the maximum value (100%). The measuring of the slat running time should be done at this lower end position.

Parameter page	Parameter	Value
1:Drive	Time basis for running time of slat	(10), 100 ms
1:Drive	Factor for running time of slat	5 - 255 _____

Slat step interval (only for blind with slats)

Depending on the slat running time, the number of steps for opening or closing the slats can be defined. The time for one short movement of the slats is called step interval.

E.g. slat running time = 1 second and step interval = 0.1 seconds –> slats can be completely opened in 10 steps.

Parameter page	Parameter	Value
1:Drive	Time basis for step interval of slat	(10), 100 ms
1:Drive	Factor for step interval of slat	5 - 255 _____

Pause on reverse for change of direction

When the blind actuator moves and receives a command to move to the opposite direction, it stops and waits for the pause of reverse interval to pass.

Caution! Pauses on reverse interval that are too short could cause damage to the drive. When setting the values, observe the manufacturers specification for the drive under all circumstances.

Parameter page	Parameter	Value
1:Drive	Pause on reverse on change in direction (1-255) factor * 100 ms	_____ ms

Technical specifications

Additional weather alarm and automatic function

fine tuning

Caution! When the blinds or other hangings are mounted on the outside of the window the use of automatic weather alarm functions are recommended.

A weather station is not a part of this room-solution and has to be ordered separately. We recommend using at least one weather station for each facade with outside mounted blinds. For the detailed planning (e.g. thresholds) you have to observe the manufacturers specifications for the drive under all circumstances.

This shutter and blind solution is prepared for A-class. A-classification needs additional functionality, which realises an automatic pulling down of the shutter or blind dependant on the outside temperature and lux value, in order to save the room from outside thermal influences. This automatism will be controlled by a central control unit (central building management function) plus a weather station sensing conditions outside the building.

A description on an exemplary functionality is shown in Appendix 1 SB, which will be automatically added to your project's document-folder, when selecting a solution with shutter/blind functionality to your project.

Power failure behaviour

Switch actuator: Relay state after bus voltage failure: no change (relay remains)

Control unit 0-10V: Relay state after bus voltage recovery: opened (light is OFF)

Blind actuator: Behavior when bus voltage fails: no reaction (relay remains)

Blind actuator: Behavior on bus voltage recovery: stop (no movement)

When you want to set another behavior for the blind actuator you can enable the parameter page „failure mode". For more detailed information please read the application manual.

Technical specifications

User manual

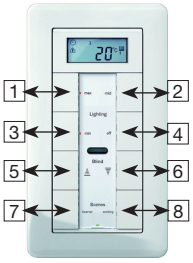
The user manual provided for the application is an end users training material and can be installed at site when final submission is made.

Please do no forget to cut out this quick guide for the user and attach to the wall next to the entrance to the room. Also, make sure the customer is aware of the installed applications function.

Quick guide

This room is equipped with movement dependent automatic light control with light regulation and manual control, shutter/blind and temperature control.

Lighting control
Automatic mode operation
The lights are automatically switched ON when a person enters the room and the brightness value is below the selected brightness threshold.
If no movement is detected within a delay time of 25 minutes, the light will be dimmed down to minimum. If no movement is detected for another 5 minutes the light will be switched off. When the lights are on, the light controller in the presence detector maintains the decided lux set point by sending dimming telegrams to the lamp actuator. If the daylight will increase, the regulation dims down the artificial light. If it decreases, the regulation will dim up the artificial light.



Manual mode operation
The user can also select the lux set point by the pushbutton unit. Button 1 will give high brightness (500 lux), button 2 will give medium brightness (300 lux) and button 3 low brightness (100 lux). With button 4 permanent-OFF can be activated. The light will then be off until one of the other buttons is pressed. When permanent OFF is activated the status LED next to the button is blinking.

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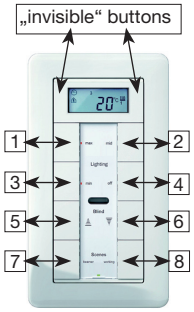
service for your customer

Technical specifications

User manual

Quick guide

This room is equipped with movement dependent automatic light control with light regulation and manual control, temperature control.



Temperature control, heating/cooling
Movement detection will automatically set the temperature control into comfort-mode. To save energy this will not happen until a person has been in the room for more than 3 minutes. In this way the temperature control is not affected if someone is present in the room just for a short period of time. If no movement is detected within a delay time of 25 minutes the temperature control is set into standby-mode.

Comfort-mode:
default room temperature set point,
heating 21 °C cooling 24 °C

Standby-mode:
default room temperature set point,
heating 19 °C cooling 26 °C

Frost/Heat protection:
heating 7 °C cooling 35 °C

The set point can be adjusted by the user +/- 3°C from given set point. This is done by pushing „invisible“ buttons on both sides of the display frame. If a window contact (breaking contact) is connected to the EMO valve drive, the temperature control will be set into frost/heat protection mode when the window is open.

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Technical specifications

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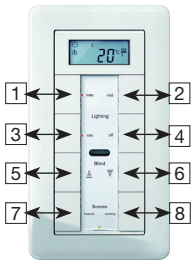
Quick guide

This room is equipped with movement dependent automatic light control with light regulation and manual control, temperature control.

Blind/shutter control
A blind or roller shutter motor with end position can be connected to each channel of the blind actuator. The position of the blind‘s or shutter‘s height can be adjusted manually by push-buttons. With a long push on button 5 the blind or roller shutter moves upwards. With a long push on button 6 the blind or roller shutter moves downwards. With a short push the movement of the blind or shutter stops. In the case of a blind or hanging with slats the angle of the slats can also be moved stepwise with several short pushes. With button 6 the slats turn to the position „100% closed“ or to the mechanically determined working position. With button 5 the slats move to the opposite direction. The possible angles of the slats depend from the mechanical construction of the blind with slats.



Scene control
A scene for a beamer presentation can be recalled with button 7. Thereby the blinds or shutters will be lowered to 80% closed and the light will be set to a low lux-level (50 lux). By use of button 8 the blinds or shutters will be moved completely upwards again and the standard lighting level (500 lux) will be activated.

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